NETWORK SERVER BACKUP TAPE ROTATION, STORAGE, AND ARCHIVING

Purpose   This Air Quality Group procedure describes the rotation, storage, and archiving of computer backup tapes for the ESH-17 servers located at TA-00, Bldg. 1331.

Scope   This procedure applies to backups performed by both the single tape drive unit and the HP multi-tape autoloader on the group's network servers located at TA-00, Bldg. 1331.

In this procedure   This procedure addresses the following major topics:

Hazard Control Plan   The hazard evaluation associated with this work is documented in HCP-ESH-17-Office Work.

Signatures

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General information about this procedure

Attachments   This procedure has no attachments.

History of revision   This table lists the revision history and effective dates of this procedure.

Revision	Date	Description Of Changes
0	8/8/96	New document.
1	9/19/97	Title change, process revisions, and clarification.
2	11/23/99	Added new chapter for new HP autoloader.
3	2/20/01	Updated steps for new installations and hardware.

Who requires training to this procedure?   The following personnel require training before implementing this procedure:
- Network Administrator
- Computer technicians
- ESH-17 personnel assigned to run backups
- ESH-17 group records coordinator

Training method   The training method for this procedure is "**self-study**" (**reading**) and is documented in accordance with the procedure for training (ESH-17-024).

General information, continued

Definitions specific to this procedure

<u>Backup operator</u>: An ESH-17 employee assigned the responsibility of maintaining a network server backup system.

<u>Full backup</u>: A backup operation in which all files on a drive are backed up, regardless of whether the file has changed since the last full backup.

<u>Daily tape</u>: A tape used to perform a full backup on Monday, Tuesday, Wednesday, or Thursday night.

<u>Weekly tape</u>: A tape used to perform a full backup on Friday.

References

The following documents are referenced in this procedure:
- ESH-17-024, "Personnel Training"
- Seagate "Backup Exec" software manual

Note

Actions specified within this procedure, unless preceded with "should" or "may," are to be considered mandatory guidance (i.e., "shall").

Backup tape rotation for single tape drive

Background ESH-17 performs daily and weekly backups on all its servers located at TA-00, Bldg. 1331; one or more servers have the older single-tape drive unit (covered in this chapter) and others have the newer HP autoloader unit (covered in the next chapter *Multiple backup tape rotation*). Daily and weekly backups performed by ESH-17 are full backups. Full backups have the advantage that regardless of whether the entire system needs to be restored or only a few files, all of the most current information is located on one tape. The disadvantages of full backups are that many tapes contain redundant information if files do not change frequently (however, the low cost of tape back-up media minimizes this disadvantage) and they are time-consuming (thus the scheduling of these backups for late at night when the servers are not likely to be heavily used). A file's archive bit is changed by the backup software to indicate that the file has been backed up.

Initial backup tape setup When a new server backup system is started, the **backup operator** prepares five new tapes of the appropriate size and type for the tape backup unit. The tapes labeled "Monday" through "Thursday" are daily tapes that are re-used several times. The tape labeled "Friday" is the initial weekly tape and will not be re-used.

Label five new tapes for each server with the server name and day and date the tapes are to be put into service.

> Example: Backup system initiated on Monday, April 1, 1996:
> *Server Name*, Monday - 4/1/96
> *Server Name*, Tuesday - 4/2/96
> *Server Name*, Wednesday - 4/3/96
> *Server Name*, Thursday - 4/4/96
> *Server Name*, Friday - 4/5/96

Tape rotation At the beginning of each work week (usually a Monday), examine the four daily tapes for Monday through Thursday to determine which tape is the oldest based on the date the tape was put into service. Use the oldest tape from the collection of daily tapes to make the Friday backup for the current week. This tape will be archived as described in the next chapter.

Backup tape rotation for single tape drive, continued

Steps for Monday backup tape rotation

To maintain the backup tape rotation cycle, perform the following steps on **Monday** of every week:

NOTE: Monday means the first working day of the week. **Friday** means the last working day of the week.

Step	Action
1	Select the oldest tape from the daily backup tapes used Monday through Thursday of the previous week. Re-label the oldest tape with "Friday" and the date for the Friday of the current week.
2	To replace the tape selected in *Step 1*, label a new (unused) daily tape with the day of the week and the date it will be put into service.
3	Remove the tape (previous "Friday" tape) from the tape backup unit and store it in the fire resistant safe. Insert the tape labeled for Monday. **NOTE**: Normally, backups are scheduled by a system administrator to run automatically. No manual interaction with the software is required at the time the tape is changed. See the server-specific backup software documentation for details on backup scheduling or contact the system administrator.

Tuesday thru Thursday backup tape rotation

To maintain the backup tape rotation cycle, perform the following steps on **Tuesday** through **Thursday** of every week:

Step	Action
1	Remove the tape from the tape backup unit and store it in the tape storage drawer near the server.
2	Insert the tape labeled for the present day (Tuesday, Wednesday, or Thursday). No scheduling is required.

Friday backup tape rotation

To maintain the backup tape rotation cycle, perform the following steps on **Friday** of every week:

Step	Action
1	Remove the tape from the tape backup unit and store it in the tape storage drawer near the server.
2	Clean the tape backup unit by running a cleaning tape for one cleaning cycle.
3	Insert the "Friday" (weekly backup) tape. No scheduling is required.

Backup tape rotation for autoloader

Background   HP autoloader backup units are installed on the Microsoft Windows NT servers *cleanair* and *hotair* located at TA-00, Bldg. 1331 (the server *coolair* is a backup server and does not require data backup). Other servers may have similar autoloader units installed in the future. The units will perform a full back up of each drive on the server every day for a week without attention. This chapter describes the process to load and rotate the tapes in these machines.

Using tape machine   Read the manuals for the HP autoloader unit and the Seagate "Backup Exec" software. Run the "Backup Exec" software to set up the automated backup process. Use the setting called "Low Administrative Backup Feature" to program the automated backups (this standardized backup routine will automatically set the autoloader to do a full backup five days a week and clean the autoloader on Mondays).

Loading tapes in cartridge   The tape holder cartridge holds 6 tapes. Load a special cleaning tape into slot #6. Load a tape for each day's backup into slots #1 through #5 (corresponding to Monday through Friday).

NOTE: Do not place labels on the tapes: the tape-handling mechanism can pull them off and jam the works.

Switching tapes every Monday   To switch the tapes after a week of backups, perform the following steps every Monday:

Step	Action
1	Determine the autoloader slot that was used for last Friday's backup: (It *should* be slot 5, but occasionally problems such as bad tapes will cause a different slot to be used.) Start Backup Exec. In the "Job Monitor" window, double-click on the backup job dated on the previous Friday. Click "Log File" and scroll down the log file to the line with "Media Slot:" and a number. Usually this number will be 5, but if it is a different number, remember what it is!
2	Eject the cartridge from the autoloader and remove the Friday tape from slot #5. (or whichever slot was determined in step 1)
3	Label this tape with the name of the server and the date of its (Friday) backup. Store it according to the steps in the chapter *Archiving backup tapes*.

Steps continued on next page.

Backup tape rotation for autoloader, continued

Step	Action
4	Remove the tape from slot #4 (or whichever slot is one number smaller than the slot where the Friday tape was) and move it to the now-empty next higher numbered slot (from which the Friday tape was removed). Similarly, move all the other tapes to the next higher-numbered slot.
5	Take a new tape and place it in slot #1 (Monday). The cartridge is ready to be loaded in the autoloader on this or a future Monday.
6	Install a loaded cartridge into the autoloader.
7	In the Backup Exec window, click "Devices". In the left frame of the Devices window, click "Slots".
8	In the right frame, right-click on Slot 1 and from the pop-up menu, select "Label Media". Click "OK" on the warning.
9	In the "New Cartridge Label" box, enter a label and click OK. While the exact contents of the label are not critical to the backup operation, the following label format is suggested for consistency to aid in identifying tapes: `Server Abbreviation  Week#  1ˢᵗ Letter of Month  zero  Slot#` Examples: **CLEAN4F01** (CLEANAIR server, 4th week of Feb., Slot 1) **HOT3J05** (HOTAIR server, 3rd week of Jan., Slot 5) Click "OK" on the warning. It takes a minute or two for the re-label process to finish. When your new label appears under the "Cartridge Label" column for the selected slot, the job is done.
10	Repeat steps 8-9 for slots 2-5, IN ORDER! It is important to label the slots in numeric order so the Allocation Date times are ascending. This ensures that the backup program will use the tapes in correct order.
11	Right-click on slot 6 and select "Scan" from the pop-up menu. This ensures that the slot is properly identified as containing cleaning media.
12	Close Backup Exec.

Backup tape rotation for autoloader, continued

If Mondays are skipped

If the regular Monday tape rotation is missed, the program will re-record over the Monday tape, thus erasing the backup from the previous Monday. This is not usually a problem, but to avoid the data loss, the "Monday" tape rotation may be performed any time after the Friday backup has run (i.e., Saturday morning through Monday evening).

NOTE: It is not recommended that the Monday tape be switched before Friday, because the program logic may tell the machine to use the newly-installed tape (e.g., tape #1) rather than the "normal" tape for that day (e.g., tape #4 or #5).

Restoring files

NOTE: The following is not fully documented in the program manual. When necessary to use the autoloader to restore saved data files, the automated backup program must first be disabled and then reset after the restoration.

To restore backed up files, perform the following steps:

Step	Action
1	In the program "Backup Exec," go to the tab "Job Definitions," select each entry ("Labs generated backup" and "Labs generated cleaning"), and delete them.
2	Go to the "Restore Selections" tab and find the tape volume number by the date the file was stored. Find that tape and insert it into a cartridge and then into the tape drive.
3	Find the appropriate drive, folder, and file(s) to be restored, and follow the program instructions to restore the desired files.
4	After restoring any files, reestablish the automatic backup routine by selecting "Tools" then "Low Administration Wizard."

Archiving backup tapes

Storing backup tapes

Store the last backup tapes from each week of the month, usually the Friday tape, in the fire resistant safe in TA-00, Bldg. 1331, Rm. 100, cubicle 1.

At the end of the month, transfer the last tapes of the previous month from each server to the ESH-17 records coordinator.

The **records coordinator** fills out a Records Transfer Request Form, takes custody of the "last tape(s) of the month," and transports the tape(s) to CIC-10 (TA-21, Bldg 1001) for permanent off-site storage. Keep receipts for the tapes that are transported to CIC-10 for permanent storage in the fire resistant safe in TA-00, Bldg. 1331, Rm. 100, cubicle 1 for future reference.

Keep weekly tapes that do not fall under the category of "last tape of the month" in the fire resistant safe for no less than one year, but not more than two years. After this time, recycle these tapes for future backups.

Records resulting from this procedure

Records   The following record generated as a result of this procedure is submitted to the ESH-17 records coordinator:

- Copy of Records Transfer Request Form, when tapes archived to records center

The following records are maintained by ESH-17 for a minimum of one month, but not more than two months, then transferred by the records coordinator to CIC-10 for permanent storage:

- last "Weekly" backup tapes of each month.

[Click here to record "self-study" training to this procedure.](#)